

What is claimed is:

1. A semiconductor device comprising:

a silicon semiconductor layer of first conductivity type;

an insulating oxide film having an opening and laminated
5 on said silicon semiconductor layer of first conductivity type;

a first poly-silicon film formed on said insulating oxide
film and having an opening located at the same position as the
opening formed in said insulating oxide film;

an impurity diffused layer of second conductivity type
10 formed on an exposed portion of said silicon semiconductor layer
of first conductivity type, the exposed portion being exposed
through the openings of said insulating oxide film and said
first poly-silicon film;

a second poly-silicon film formed on said first
15 poly-silicon film and in said openings; and

a thin uniform oxide film serving as a contact and having
a removed portion uniformly formed between said impurity
diffused layer of second conductivity type and said second
poly-silicon film and between said first poly-silicon film and
20 said second poly-silicon film.

2. A method of manufacturing a semiconductor device
comprising the steps of:

laminating an insulating oxide film and a first
poly-silicon film sequentially in order on a silicon
25 semiconductor layer of first conductivity type;

forming an opening by selectively etching said insulating
oxide film and said first poly-silicon film and exposing a part
of said silicon semiconductor layer of first conductivity type
through said opening;

30 forming an impurity diffused layer of second

conductivity type by implanting an impurity of second conductivity type into the exposed portion of said silicon semiconductor layer of first conductivity type;

removing a natural oxidation film from said impurity
5 diffused layer of second conductivity type and said first poly-silicon film by applying HF (hydrofluoric acid) treatment;

forming a thin uniform oxide film on the surface of said impurity diffused layer of second conductivity type and on the surface of said first poly-silicon film from which the natural
10 oxidation film has been removed;

forming a second poly-silicon film on the entire surface of the substrate and implanting the impurity of second conductivity type in said second poly-silicon film;

activating said impurity of second conductivity type
15 implanted in said second poly-silicon film and diffusing said impurity of second conductivity type into said first poly-silicon film through said thin uniform oxide film; and

forming uniformly a removed portion in said thin uniform oxide film by applying a high temperature annealing treatment
20 for a short time and forming a thin uniform oxide film serving as contact having the uniformly formed removed portion.

3. The method of manufacturing a semiconductor device according to claim 2, wherein said thin uniform oxide film is formed by H₂O₂ (hydrogen peroxide) treatment.

25 4. The method of manufacturing a semiconductor device according to claim 2, wherein said thin uniform oxide film is about 0.5nm to 10nm in thickness.

5. The method of manufacturing a semiconductor device according to claims 2, wherein temperature in the high
30 temperature annealing treatment for a short time is about 950°C

to 1150°C, and treating time is about 10sec to 3min.